REMARKS

The Office Action dated March 22, 2004 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 4 and 13 have been amended. Claim 6 has been cancelled. No new matter has been added, and no new issues are raised which require further consideration and/or search. Claims 1-5 and 7-17 are submitted for consideration.

In the Office Action Summary, the box associated with the drawings under Application Papers was checked. However, there was no indication as to whether the drawings were accepted or objected to by the Examiner.

Claims 1-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,034,349 to Ota in view of U.S. Patent No. 6,599,790 to Yamazaki et al. The rejection is traversed as being based on references that neither teach nor suggest the novel combination of features clearly recited in independent claims 1, 4, 7 and 13.

Claim 1, upon which claims 2-3 depend recites a laser drilling method for carrying out the drilling by irradiating a workpiece with laser light from a laser oscillator through a mask having a predetermined mask pattern. The laser light is transformed into laser light having a linear cross-section. An irradiation position of the linear laser light is fixed. The mask and the workpiece are synchronously moved so that the mask passes through an irradiation position of the laser light while the moving direction thereof is made perpendicular to the extending direction of the linear laser light so that the mask is

scanned by the linear laser light. The drilling defined by the mask pattern thereby is carried out to the workpiece.

Claim 4, upon which claims 5 depends, recites a laser drilling method for carrying out the drilling by irradiating a workpiece with laser light from a laser oscillator through a mask having a predetermined mask pattern. The laser light is transformed into laser light having a linear cross-section. The mask arranged at a predetermined position is irradiated with the linear laser light. The workpiece is moved in the perpendicular direction to the extending direction of the linear laser light, so that the workpiece is scanned by the laser light passing through the mask. The drilling defined by the mask pattern thereby is carried out to the workpiece. The displacement of the workpiece is detected, and the oscillation operation of the laser oscillator is controlled in accordance with the detected displacement.

Claim 7, upon which claims 8-12 depend, recites a laser drilling apparatus for carrying out the drilling by irradiating a workpiece with laser light from a laser oscillator through a mask having a predetermined mask pattern. The apparatus includes an optical system for transforming the laser light into laser light having a linear cross-section and a drive mechanism for synchronously moving the mask and the workpiece. An irradiation position of the linear laser light from the optical system is fixed. The drive mechanism moves the mask and the workpiece so that the mask passes through an irradiation position of the laser light. The moving direction thereof is made perpendicular to the extending

direction of the linear laser light so that the mask is scanned by the linear laser light. The drilling defined by the mask pattern thereby is carried out to the workpiece.

Claim 13, upon which claims 14-17 depend, recites a laser drilling apparatus for carrying out the drilling by irradiating a workpiece with laser light from a laser oscillator through a mask having a predetermined mask pattern. The apparatus includes an optical system for transforming the laser light into laser light having a linear cross-section and a drive mechanism for moving the workpiece. The mask arranged at a predetermined position is irradiated with the linear laser light from the optical system. The drive mechanism moves the workpiece in the perpendicular direction to the extending direction of the linear laser light so that the workpiece is scanned by the laser light passing through the mask. The drilling defined by the mask pattern thereby is carried out to the workpiece. The displacement of the workpiece is detected and the oscillation operation of the laser oscillator is controlled in accordance with the detected displacement.

As will be discussed below, the cited prior art references of Ota and Yamazaki et al. fail to disclose or suggest the elements of any of the presently pending claims.

Ota teaches a laser machining system that bores holes in a work. Col. 3, lines 14-16. A laser oscillator emits pulse laser to a beam splitter through a shutter which allows or interrupts the path of the laser light. Col. 3, lines 17-20. A portion of the laser sampled by the beam splitter is directed to a laser output sensor which directs its output to a control section for determining output energy of each pulse of the emitted pulse laser light based on the output received. Col. 3, lines 26-30. The laser light through the beam

splitter is entered into a laser scanner where the path of the laser light is deflection-scanned so that the laser light is sequentially irradiated to a plurality of different machining spots on a work. Col. 3, lines 31-36. The laser scanner has a mechanism to deflect and scan the entered laser light in a given direction at high speed. Col. 3, lines 37-41. In respective light paths, to be deflected by the laser scanner there are disposed slits, scanner mirrors, beam forming masks having a mask pattern similar to a machining pattern and lenses through which the laser light is irradiated to the work. Col. 3, lines 42-50. The work is placed on a machining table and drilled by the entered laser light. A control section controls to activate and stop the laser oscillator, to open and close the shutter, to scan by the laser scanner, to move the machining table, and to adjust finely the positions and angels of the scanner mirrors, beam forming masks and lenses. Col. 3, lines 51-59.

Yamazaki et al. teaches a laser device for providing laser energy distributed in a range. Col. 5, lines 30-33. A pulse light emitted from a laser generator is processed into a pulse beam having a linear cross section by using an optical system, reflected by a mirror and is irradiated to an object substrate through a quartz window into a laser irradiation chamber. Col. 5, lines 34-39.

Applicant submits that combination of Ota and Yamazaki et al. does not teach or suggest the elements of claims 1-17. Claim 1, in part, recites that the mask and the workpiece are synchronously moved so that the mask passes through an irradiation position of the laser light while the moving direction thereof is made perpendicular to the

extending direction of the linear laser light so that the mask is scanned by the linear laser light. Claim 7, in part, recites the drive mechanism moves the mask and the workpiece so that the mask passes through an irradiation position of the laser light, the moving direction thereof being made perpendicular to the extending direction of the linear laser light so that the mask is scanned by the linear laser light. Although, as discussed above, Ota teaches in Col. 3, lines 51-59 that a control section controls the laser oscillator, the shutter, the laser scanner, the movement of the machining table, and the adjustments of the positions and angels of the scanner mirrors, beam forming masks and lenses, Ota does not disclose passing, in a synchronized manner, the mask and workpiece to the irradiation position of the laser while the moving direction of the mask and workpiece is made perpendicular to the extending direction of the linear laser light as recited in claims 1 and 7.

Claim 4, in part, recites that the workpiece is moved in the perpendicular direction to the extending direction of the linear laser light, so that the workpiece is scanned by the laser light passing through the mask, the drilling defined by the mask pattern thereby being carried out to the workpiece, wherein the displacement of the workpiece is detected, and the oscillation operation of the laser oscillator is controlled in accordance with the detected displacement. Claim 13, in part, recites that the drive mechanism moves the workpiece in the perpendicular direction to the extending direction of the linear laser light so that the workpiece is scanned by the laser light passing through the mask, the drilling defined by the mask pattern thereby being carried out to the workpiece,

wherein the displacement of the workpiece is detected, and the oscillation operation of the laser oscillator is controlled in accordance with the detected displacement. Ota does not teach or suggest (1) that the workpiece is made perpendicular to the extending direction of the linear laser light so that the mask is scanned by the linear laser light and drilling defined by the mask pattern is carried out to the workpiece, and (2) that the displacement of the workpiece is detected and the oscillation operation of the laser oscillator is controlled in accordance with the detected displacement as recited in claims 4 and 13.

Yamazaki et al. does not cure the deficiencies of Ota outlined above with respect to independent claims 1, 4, 7, and 13. Specifically, Yamazaki et al does not teach or suggest passing the mask and workpiece to the irradiation position of the laser while the moving direction of the mask and workpiece is made perpendicular to the extending direction of the linear laser light as recited in claims 1 and 7. Yamazaki et al also does not teach or suggest moving the workpiece in the perpendicular direction to the extending direction of the linear laser light so that the workpiece is scanned by the laser light passing through the mask, the drilling defined by the mask pattern thereby being carried out to the workpiece, wherein the displacement of the workpiece is detected, and the oscillation operation of the laser oscillator is controlled in accordance with the detected displacement as recited in claims 4 and 13. Therefore, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Ota et al. nor

Yamazaki et al., whether taken singly or combined, teaches or suggests each element of claims 1, 4, 7 and 13 and hence dependent claim 2-3, 5, 8-12 and 14-17.

As noted previously, claims 1-5 and 7-17 recite subject matter which is neither disclosed nor suggested in the prior art references cited in the Office Action. It is therefore respectfully requested that all of claims 1-5 and 7-17 be allowed and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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Enclosures: Information Disclosure Statement